

EXECUTIVE SUMMARY

The Rhode Island Sound Disposal Site (RIDS) was monitored by Science Applications International Corporation (SAIC) several times in 2003 as part of the Disposal Area Monitoring System (DAMOS) Program. RIDS is a 3.42 km² dredged material disposal site, which lies approximately 21 km south of the entrance to Narragansett Bay, Rhode Island. Selected specifically for use as part of the Providence River and Harbor Maintenance Dredging Project, an anticipated 3.3 million cubic meters of dredged material will be placed at RIDS over the next several months. The initial environmental monitoring operations performed over RIDS in 2003 consisted of multibeam and single-beam bathymetry, side-scan sonar, REMOTS[®] sediment-profile imaging, as well as underwater video. The survey objectives were to document the changes in seafloor topography and surficial sediment composition resulting from dredged material deposition.

Sequential bathymetric surveys performed in February, July, and September 2003 successfully tracked the development of an artificial containment cell within the confines of RIDS. During the first five months of the maintenance project, an estimated barge volume of 706,000 m³ of coarse-grained, glacial till was strategically placed at eleven predetermined disposal points parallel to the western disposal site boundary. This mix of sand, gravel, and cohesive clay was excavated as part of the construction of several Confined Aquatic Disposal (CAD) cells within the Fox Point Reach of Providence River and used to develop a continuous ridge of sediment along the western boundary of RIDS. The purpose of this bathymetric ridge was to construct an artificial containment cell, enhancing the 500,000 m³ capacity of a natural bottom depression located in the southwestern quadrant of the disposal site. This containment feature will eventually be used to limit the lateral spread of an estimated 2.1 million cubic meters of unconsolidated, estuarine silts to be placed at RIDS during future phases of the dredging project. As of September 2003, the artificial containment cell at RIDS offered a dredged material capacity of 1.44 million cubic meters. However, the capacity of this feature is expected to increase over the next several months as additional sediment is placed at predefined disposal points along the western boundary of RIDS. It is anticipated that the final capacity of the artificial containment cell will meet or exceed the volume of unconsolidated material to be disposed.

Monitoring surveys performed over RIDS and the surrounding area of the disposal site in July 2003 as part of another program detected a variety of features on the seafloor both inside and outside the disposal site boundaries that prompted further evaluation. In September 2003, a side-scan sonar survey was completed over a 2900 × 2900 m area known as Area W to evaluate the distribution of dredged material in the area surrounding RIDS. The side-scan sonar data displayed several areas of interest, including disposal trails and the bathymetric ridge constructed within RIDS; areas of concentrated trawl scars (recent and relic) to the west of the disposal site; a naturally occurring ridge of coarse sediment to the north of RIDS; and apparent trails of recently deposited dredged material outside the disposal site boundaries.

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Underwater video and REMOTS[®] sediment-profile imaging performed in October 2003 confirmed that the majority of the features and seafloor composition detected outside the disposal site boundary were the product of ambient conditions in Rhode Island Sound. However, both past and ongoing fishing activity adjacent to RIDS appeared to be the basis for a number of linear trawl scar features that existed in the ambient sediment to the west of RIDS. The depth of the furrows created by the dragging doors of a trawl net and the silty sand comprising the seafloor in this area likely allowed the scars on the seafloor to persist for a substantial length of time after the disturbance and remain detectable in the side-scan sonar record.

In addition, the seafloor imagery also confirmed the presence of dredged material outside the disposal site boundaries in the form of continuous narrow, low-relief trails of deposited sediment. Similar disposal trail features were also detected within the confines of RIDS, suggesting these deposits were the product of residual dredged material being washed from open split-hull disposal barges as they began a return transit to Narragansett Bay following a disposal event. The presence of disposal trails outside the boundary was the result of barges continuing their course after the load was placed at one of the eleven predetermined disposal points established along the western disposal site boundary. The observations in July resulted in an immediate change in disposal practices that required the barges to be closed before leaving the site boundaries.

The most prominent disposal trail was found approximately 450 m outside the disposal site boundary and determined to be approximately 1,100 m in overall length, with widths ranging from 12 to 35 m. The sediment detected in the October 2003 survey was comprised of a mix of coarser-grained material (sand, gravel, and cobble) and clumps of cohesive clay. Based on its composition and contrast to the ambient sediments, it appears this disposal trail represents a deposit of material removed from the Fox Point Reach of the Providence River during CAD cell construction. Despite a change in surface sediment composition at some stations within the survey grid, the impacts to the resident benthic community were minimal to non-existent. As a result, it can be inferred that the seafloor immediately surrounding this disposal trail, as well as those of lesser consequence elsewhere in the region, readily recovered from any highly localized benthic disturbances.